Evaporation of Barium from the Surface of Certain Metals

where $x = \lg \frac{i}{i_o}$ and $b = \lg \frac{i_1}{i_o}$ and t is time,

λ is the evaporation temperature, T is the filament temperature in °K, τ is the average lifetime of a barium atom on the surface of the filament, τ_o is a constant, i_o is the electron emission of a clean filament ($\theta = 0$), i_1 is the emission of the filament having an optimum coating ($\theta = 1$) and i is the emission as measured at a value of $\theta > 0$; θ is the so-called coverage coefficient which is defined as $\theta = \lg(i/i_o) / \lg(i_1/i_o)$. The measured filament had a length of 120 to 140 mm and a diameter of 89 to 100 μ. Curves of $\lg(i/i_o)$ as a function of t, of $\lg(1/\tau)$ versus θ and of $\lg(1/\tau)$ versus $1/T$ were taken for the following systems: barium layer on pure tungsten, barium layer on rhenium-coated tungsten, barium layer on carburised tungsten, and barium on platinum-coated tungsten (see Figs. 2 to 12). It was found

 that: 1) for equal values of θ and T, the evaporation

Evaporation of Barium from the Surface of Certain Metals

velocity of barium from platinum-coated tungsten is much lower than that of the other three surfaces; 2) the evaporation velocity of barium from the surface of pure tungsten is much larger than the velocity of an actual L-cathode. The cause of the latter effect is due to the fact that an actual L-cathode is a much more complicated system than a simple barium-tungsten system. The author thanks Corresponding Member of the Ac.Sc. USSR N.D. Morgulis for proposing the subject and showing constant interest in this work. There are 12 figures, 5 tables and 18 references, 8 of which are Slavic.

ASSOCIATION: Physics Institute of the Ac.Sc. Ukrainian SSR , Kiyev. (Institut fiziki AN USSR, g. Kiyev)

SUBMITTED: May 8, 1957

AVAILABLE: Library of Congress

Card 3/3

9 (3)

SOV/112-57-5-10987

Translation from: Referativnyy zhurnal., Elektrotekhnika, 1957, Nr 5, p 206 (USSR)

AUTHOR: Marchuk, P. M.

TITLE: Phenomena Accompanying the Operation of a Tungsten-Cathode Diode Filled With a Low-Pressure Cesium Vapor (Yavleniya pri rabote dioda s vol'framovym katodom v parakh tseziya pri nizkom davlenii)

PERIODICAL: Tr. In-ta fiziki AS UkrSSR, 1956, Nr 7, pp 3-16

ABSTRACT: The influence of positive Cs ions obtained by thermal ionization on a tungsten cathode has been investigated, as well as the influence of the anode-cathode contact potential difference upon the shape of the voltage-current curves of an electronic-tube current having a pronounced saturation section; various cathode heatings and Cs-vapor pressures have been used. The following phenomena have been studied experimentally: (1) conditions of complete compensation of electron space charge by Cs positive ion charges; (2) operation of a diode terminated by an external resistance with anode-voltage cutoff;

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SOV/112-57-5-10987

Phenomena Accompanying the Operation of a Tungsten-Cathode Diode Filled . . .

(3) effect of a magnetic field on the diode anode current. It is pointed out that with higher Cs-vapor density, the effect of a magnetic field on the anode current value is greatly diminished as a result of electron scattering by Cs atoms and also as a result of a relatively large ion space charge that makes the anode-cathode medium plasma-like. The experimental tube and measurement methods are described. Bibliography: 11 items.

E. Yu. E.

Card 2/2

MARCHUK, P. M.

MORJULIS, M.D.; MARCHUK, P.M.

Transformation of heat energy into electrical energy by thermionic emission. Ukr. fiz. zhur. 2 no.4:379-380 O-D '57. (MIRA 11:3)

1. Institut fiziki AN URSR.
(Thermonic emission)

Marchuk, P.M

AUTHORS: Marchuk, P.M. and Lozovaya, Ye.A. 109-12-11/15

TITLE: A Directly Heated, Miniature Porous Metal-film Cathode (L-cathode) (Malogabaritnyy poristyy metallo-plenochnyy katod pryamogo nakala)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol.II, No.12, pp. 1544 - 1547 (USSR)

ABSTRACT: The investigated cathode was in the form of a fine tube, made of porous tungsten which was filled with barium carbonate and a quantity of an activating material (a mixture of tungsten powder and powdered graphite). The tube was sealed hermetically at the ends and fitted with two current leads. The cathode had a diameter of 1.5 mm, an active length of 9 mm, an overall length of 13 mm and a wall thickness of 0.25 mm. The investigation of the emissivity of the cathode was carried out in cylindrical, sealed-off diodes, whose anode was fitted with protective rings. The diodes were evacuated down to a pressure of 1×10^{-7} mmHg and then flashed by means of a BaAl getter. The emissivity was investigated by taking the current-voltage characteristics ($I_a = f(U_a)$) at various cathode temperatures T_k (from 900 - 1 200 °C). The resulting curves are shown in Figs. 1 and 2, while Fig. 3 shows $\lg j/T^2 = f(1/T)$.

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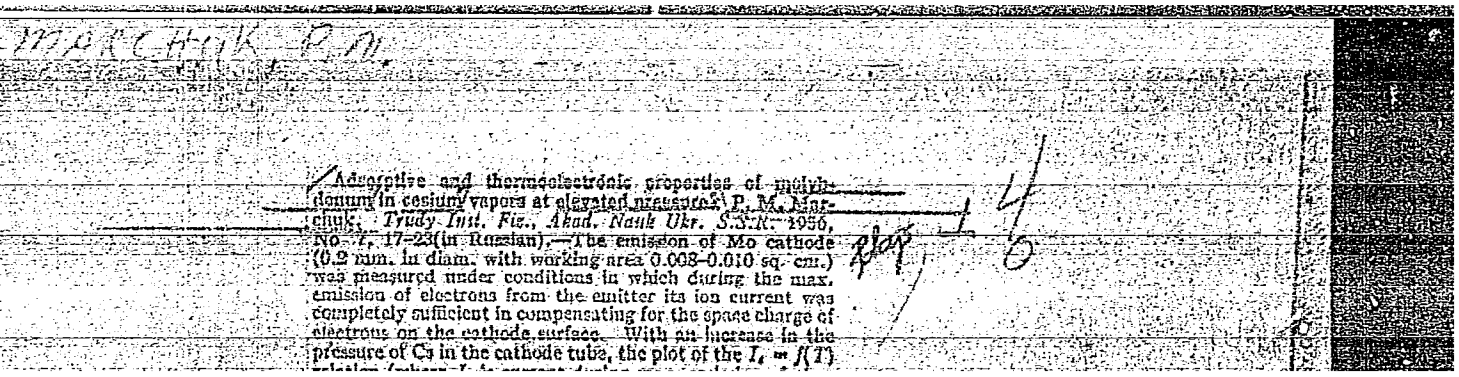
A Directly Heated, Miniature Porous Metal-film Cathode (L-cathode)

From the latter figure, it is possible to determine the thermionic constants of the cathode; it is found that φ = 1.62 - 1.67 eV and A = 10.0 - 13.0 A/cm^2 $^\circ$C^2. Fig. 4 shows the emissivity of the cathode as a function of time, from which it follows that, at temperatures of about 1 200 $^\circ$C, the life of the cathode is about 500 hours. Since the decay in the emissivity is mainly due to the evaporation of the barium from the surface of the cathode, the rate of evaporation was determined at T_k = 1 180 $^\circ$C and was found to be 3 mg/cm^2 per 100 hours. The authors thank Professor Morgulis for his interest in this work and for valuable advice. There are 6 figures, and 8 references, 1 of which is Slavic.

ASSOCIATION: **Physics Institute AS Ukrainian SSR, Kiyev (Institut fiziki AN USSR, g. Kiyev)**

SUBMITTED: May 8, 1957.

AVAILABLE: Library of Congress



Adsorptive and thermoelectronic properties of molybdenum in cesium vapors at elevated pressures. P. M. Marchuk. *Trudy Inst. Fiz., Akad. Nauk Ukr. S.S.R.* 1956, No. 7, 17–23 (in Russian).—The emission of Mo cathode (0.2 mm. in diam. with working area 0.008–0.010 sq. cm.) was measured under conditions in which during the max. emission of electrons from the emitter its ion current was completely sufficient in compensating for the space charge of electrons on the cathode surface. With an increase in the pressure of Cs in the cathode tube, the plot of the $I_e = f(T)$

MORGULIS, N.D.; MARCHUK, P.M.

Investigation of a cesium arc redtifier [In Ukrainian with summary in English]. Ukr.fiz.zhur. 3 no.1:95-103 Ja-F '58. (MIRA 11:4)

1.Institut fiziki AN URSR.
(Cesium) (Electric current rectifiers)

BORZYAK, P.G. [Borziak, P.H.]; Marchuk, P.M.; Sarbey, O.G. [Sarbei, O.H.]

Current-voltage characteristics of the photoelectron emission of germanium. Ukr.fiz.zhur. 4 no.4:525-526 Jl-Ag '59. (MIRA 13:4)

1. Institut fiziki AN USSR.
(Germanium) (Photoelectricity)

81777
S/181/60/002/02/21/033
B006/B067

9.3120

AUTHORS: Borzyak, P. G., Marchuk, P. M., Sarbey, O. G.

TITLE: Current-voltage Characteristics of the Photoelectron Emission of Germanium

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 2, pp. 306-313

TEXT: The authors report on investigations of the current-voltage characteristics of photoelectron emission of germanium layers with a low work function. P. I. Lukirskiy (Ref. 1) has already shown that these characteristics can be obtained in the field of a spherical condenser when the diameter of the emitter is small compared with the diameter of the collector. For the investigations germanium was vaporized on a metal disk in vacuum. With strongly reduced work function of the electrons from the germanium surface, the contact potential difference between the front, the emitting, and the back layers of the disk forms a barrier field for the photoelectrons, as is shown by model experiments in the electrolytical tank of Fig. 1. For investigating the current-voltage characteristics of germanium of three-electrode device was used whose

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Current-voltage Characteristics of the Photoelectron Emission of Germanium

S/181/60/002/02/21/033
B006/B067

schematical drawing is shown in Fig. 2. Its construction is described in detail. The results which are shown in diagrams are discussed after a detailed description of the experiments. Fig. 3 shows the characteristics which were recorded at an irradiation wavelength of 240, 254, 280, 313, 365, 435, and 546 mμ. A quartz monochromator with a ПРК-4 (PRK-4) lamp served as light source. The energy distribution of the emitted electrons is discussed in the following. Fig. 4 shows $dI/dV = f(V)$ for the first six λ-values. The first of these curves (largest $h\nu$) shows linear course, the following linear rise, a peak, and steep decline. With increasing λ the curves become more symmetrical, the curve for 435 mμ shows a steep exponential rise, a peak with a horizontal peak line and a decline corresponding to the rise. The characteristics shown in Fig. 3 are then referred to the lines λ = 313 mμ and the lines on the left side are, according to Einstein's law, referred to the quantities $(h\nu_{313} - h\nu)/e$ and those on the right side to $(R\nu - h\nu_{313})/e$. The results are shown in Fig. 5 and discussed in the following. There are 5 figures and 8 references: 7 Soviet and 1 American.

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81777

Current-voltage Characteristics of the Photoelectron Emission of Germanium

S/181/60/002/02/21/033
B006/B067

ASSOCIATION: Institut fiziki AN USSR Kiyev (Institute of Physics of the AS UkrSSR Kiyev)

SUBMITTED: April 20, 1959

Card 3/3

86807

9.4160 (3201, 1003, 1105)
26.1512

S/185/60/005/001/006/018
A151/A029

AUTHORS: Borzyak, P.G.; Marchuk, P.M.; Mityans'kiy, G.F.

TITLE: Photo-Electronic Emission of the Intermetallic Compounds Mg_2Sn and InAs

PERIODICAL: Ukrayins'kyy Fizychnyy Zhurnal, 1960, Vol. 5, No. 1, pp. 65 - 74

TEXT: Only the spectral characteristics of the photo-effect of the $A^{II}B^{IV}$ and $A^{III}B^{V}$ - type compounds are studied which are characterized by small, one-order widths of the restricted energy zone. The films Mg_2Sn were obtained by means of the condensation of a tungsten strip cleaned in a vacuum. For studying the film of a changeable composition of Mg - Sn, the distribution of the thermo-electronic effect of the yield φ_{temp} [ABSTRACTOR'S NOTE: Subscript temp (temperature) stands for the original T (temperatura)] along the strip 5 was determined. The results are given in Figure 3, where the curve 1 shows the distribution of φ_{temp} along the surface of the tungsten strip. Further, the film was applied on the strip, which again was cleaned in a vacuum. After that, the curve 2 was obtained. A repetition of this cycle yielded a curve which coincided with the curve 2. After a third investigation of the film, a distribution was obtained for it which

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Photo-Electronic Emission of the Intermetallic Compounds Mg_2Sn and InAs

is illustrated by the curve 3. For various sections of the film characterized by the curve 3, the authors have determined the spectral photo-electric sensitivity I_1 toward I_2 of the Cs_3Sb-photocathode: $\frac{I_1}{I_2} = (\lambda)$. The results are shown in Figure 4. Each curve is marked by a figure being the coordinate of the investigated section according to the data of Figure 3. The photo-electronic properties of Mg are characterized by the curve 28, those of Mg_2Sn by the curves 10, 13 and 16 It was established that the optimum value of the yield effect in respect to the photo-electronic emission is achieved for a metal surface at values t within the limits 4-20 and for the surface of Mg_2Sn at $t \gtrsim 70$. It can also be seen that in the case of a photoelectronic yield effect of only about 2 ev, the values of the quantum yield in Mg_2Sn remain small, reaching only the tenth part of a percent even at the highest values of $h\nu = 5$ ev. For studying the photo-electronic emission of InAs, an investigation was carried out of the surface of the break of a massive crystalline sample obtained in a high vacuum. The results of photo-electric measurements conducted on a clean, newly-obtained surface are shown by dots on the curve 1 in Figure 7. In the case of a consecutive deposition of BaO molecules on the surface of InAs, the yield effect is decreasing, according to which the characteristics 2,3 are obtained. The curve 4 corresponds to a state of the

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Photo-Electronic Emission of the Intermetallic Compounds Mg_2Sn and InAs

surface with a concentration of barium oxide molecules which is already higher than the optimum concentration. For comparison Figure 7 depicts also the curve obtained for a Cs_3Sb-photocathode, which at $\lambda = 400$ mμ had a quantum yield of $\gamma = 18\%$. A comparison of the spectral characteristics of the 3 intermetallic compounds Mg_2Sn, InAs and Cs_3Sb shows that the first two compounds differ from the latter one by efficiency values and appearance. Even at a distance of 3 ev from the border, they do not show any tendency to saturation and have lesser efficiencies than Cs_3Sb by one order or more. By making a comparison of the values $\Delta\varphi = \varphi - \varphi'$ for Mg_2Sn, InAs, and Cs_3Sb (Ref. 7) including here the data for Ge (Ref.8) the tendency toward a decrease of $\Delta\varphi$ is noted which occurs when the energy of the electronic affinity is also decreasing. There is, however, no direct proportional relationship between the electronic affinity and $\Delta\varphi$, which shows that there are still other factors affecting the value $\Delta\varphi$. There are 8 figures, 2 tables and 9 references: 6 Soviet, 1 English and 1 German.

ASSOCIATION: Instytut Fizyky AN URSR (Institute of Physics, AS UkrSSR).

SUBMITTED: July 6, 1959

Card 3/5

41566
S/057/62/032/010/004/010
B104/B102

AUTHORS: Vladimirov, V. V., and Marchuk, P. M.

TITLE: Stability of an inverse pinch

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 10, 1962, 1212-1215

TEXT: The authors study the stability of a Triax pinch in which the plasma is placed between a coaxial current-carrying conductor and a casing which is also a conductor. The field distribution in the plasma is

$$\mathbf{H}^0=\begin{cases}0,\ \frac{a}{r}H^0_{\varphi 1},\ H^0_{z1} & c<r<a\\ 0,\ H^0_{\varphi 1},\ H^0_{z1} & a<r<b\\ 0,\ \frac{b}{r}H^0_{\varphi 2},\ H^0_{z2} & b<r<R\end{cases} \quad (1)$$

$$H^0_{\varphi 1}=\frac{2I_1}{ca},\ H^0_{\varphi 2}=\frac{2}{cb}(\alpha_1 I_1-I_2),\ \alpha_1\leqslant 1.$$

where I_1 is the current in the central conductor, I_2 the current in the plasma and α_1 a coefficient characterizing the skin effect in the central conductor. The longitudinal field in the vacuum gaps is constant, hence in the case of equilibrium

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Stability of an ...

$$\left.\begin{aligned} H_{z1}^2 + H_{\varphi 1}^2 &= H_{z1}^2 + H_{\varphi 1}^2 + 8\pi p\,|_{r=a}, \\ H_{z2}^2 + H_{\varphi 2}^2 &= H_{z1}^2 + H_{\varphi 1}^2 + 8\pi p\,|_{r=b}. \end{aligned}\right\}$$

(2). The perturbation of an arbitrary quantity is sought in the form $\vec{A}-\vec{A}^0=A_1(r)\exp[i(kz+m\varphi)+\omega t]$.

The perturbed magnetic field is given in the form

$$\mathbf{H}_1 = \frac{1}{\omega}\cdot\left\{i\left(\frac{m}{r}H_{\varphi 1}^0 + kH_{z1}^0\right)V_{1r},\ i\left(\frac{mH_{\varphi 1}^0}{r} + kH_{z1}^0\right)V_{1\varphi} - \right.$$

$$\left. - r\left(\frac{H_{\varphi 1}^0}{r}\right)' V_{1r},\ i\left(\frac{mH_{\varphi 1}^0}{r} + kH_{z1}^0\right)V_{1z} - H_{z1}^{0\prime}V_{1r}\right\}.$$

(3) from which the dispersion relations

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Stability of an ...

$$X\Big|_{r=a} = -\frac{k\left(H^0_{z1}H^{0'}_{z1} + H^0_{\varphi 1}H^{0'}_{\varphi 1} + \frac{H^{02}_{\varphi 1}}{a}\right) + \left(kH^0_{z1} + \frac{m}{a}H^0_{\varphi 1}\right)^2 N_m(k)}{4\pi\omega^2\rho + \left(\frac{mH^0_{\varphi 1}}{a} + kH^0_{z1}\right)^2}\Bigg|_{r=a},$$

$$X\Big|_{r=b} = -\frac{k\left(H^0_{z1}H^{0'}_{z1} + H^0_{\varphi 1}H^{0'}_{\varphi 1} + \frac{H^{02}_{\varphi 2}}{b}\right) + \left(kH^0_{z2} + \frac{m}{b}H^0_{\varphi 2}\right)^2 Q_m(k)}{4\pi\omega^2\rho + \left(\frac{mH^0_{\varphi 1}}{b} + kH^0_{z1}\right)^2}\Bigg|_{r=b}, \qquad (4)$$

$$X = \frac{iv_{1z}}{v_{1r}};\ N_m(k) = \frac{I_m(ka)K'_m(kc) - I'_m(kc)K_m(ka)}{I'_m(kb)K'_m(kR) - I'_m(kR)K'_m(kb)};\ N_m(k) > 0,$$

$$Q_m(k) = \frac{I_m(kb)K'_m(kR) - I'_m(kR)K_m(kb)}{I'_m(ka)K'_m(kc) - I'_m(kc)K'_m(ka)};\ Q_m(k) < 0.$$

are obtained if the discharge current increases slowly. $I_m(x)$ and $K_m(x)$ are modified Bessel functions and X is determined from the generalized differential equation of Riccati

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Stability of an ...

$$X' = f(r)X^2 + g(r)X + h(r),$$

$$f(r) = k\left(1 + \frac{m^2}{k^2r^2}\right),$$

$$g(r) = \frac{1}{r} - \frac{2mH_{\varphi i}^0}{r} \cdot \frac{\left(\frac{mH_{\varphi i}^0}{r} + kH_{zi}^0\right)}{4\pi\omega^2\rho + \left(\frac{mH_{\varphi i}^0}{r} + kH_{zi}^0\right)^2} -$$

$$- 2\left(\frac{mH_{\varphi i}^0}{r} + kH_{zi}^0\right) \cdot \left(\frac{mH_{\varphi i}^{0\prime}}{r} + kH_{zi}^{0\prime}\right) \cdot \frac{1}{4\pi\omega^2\rho + \left(\frac{mH_{\varphi i}^0}{r} + kH_{zi}^0\right)^2}, \qquad (5).$$

$$h(r) = -k\left\{1 - \left[\frac{2H_{\varphi i}^0}{r} \cdot \frac{\left(\frac{mH_{\varphi i}^0}{r} + kH_{zi}^0\right)}{4\pi\omega^2\rho + \left(\frac{mH_{\varphi i}^0}{r} + kH_{zi}^0\right)^2}\right]^2 - \right.$$

$$\left. - \frac{2H_{\varphi i}^0\left(\frac{H_{\varphi i}^0}{r}\right)'}{4\pi\omega^2\rho + \left(\frac{mH_{\varphi i}^0}{r} + kH_{zi}^0\right)^2}\right\}.$$

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Stability of an ...

By way of the substitutions a) $X = -\frac{u'}{fu}$ $u'' - \left(\frac{f'}{f} + g\right)u' + fhu = 0,$

б) $X = +\frac{hu}{u'}$ $u'' + \left(g - \frac{h'}{h}\right)u' + fhu = 0.$

equation (5) is reduced to a linear second-order differential equation. The solutions to (5) for arbitrary field distributions can be obtained only numerically. If H^0_{ri} = 0 and H^0_{zi} = const then $\varkappa^2 < 0$ is obtained as stability criterion. If $H^0_{\varphi i} = \frac{A}{r}$, H^0_{zi} = const, A = $\varkappa_2 a H^0_{\varphi 1}$, $\varkappa_2 \leqslant 1$, the stability criterion has the form

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Stability of an ...

$$\left(\frac{\alpha_2 m H^0_{\varphi 1}}{a} + kH^0_{s1}\right)^2 \cdot \left(\frac{\alpha_2 m a}{b^2} H^0_{\varphi 1} + kH^0_{s1}\right)^2 >$$

$$> \left[\frac{kH^{02}_{\varphi 1}}{a} \cdot (1-\alpha_2^2) + \left(kH^0_{s1} + \frac{m}{a} H^0_{\varphi 1}\right)^2 N_m(k)\right] \cdot \left[\frac{kH^{02}_{\varphi 2}}{b} \cdot \left(1 - \frac{\alpha_2^2 a^2}{b^2} \cdot \frac{H^{02}_{\varphi 1}}{H^{02}_{\varphi 2}}\right) + \right.$$

$$\left. + \left(kH^0_{s2} + \frac{m}{b} H^0_{\varphi 2}\right)^2 Q_m(k)\right] \cdot \frac{\varphi_1(k)}{F} +$$

$$+ \left(\frac{\alpha_2 m H^0_{\varphi 1}}{a} + kH^0_{s1}\right)^2 \cdot \left[\frac{k}{b} H^{02}_{\varphi 2}\left(1 - \frac{\alpha_2^2}{b^2} a^2 \frac{H^{02}_{\varphi 1}}{H^{02}_{\varphi 2}}\right) + \right.$$

$$\left. + \left(kH^0_{s2} + \frac{m}{b} H^0_{\varphi 2}\right)^2 Q_m(k)\right] \cdot \frac{\varphi_2(k)}{F} - \left(\frac{\alpha_2 m a}{b^2} H^0_{\varphi 1} + kH^0_{s1}\right)^2 \times$$

$$\times \left[\frac{k}{a} H^{02}_{\varphi 1}(1-\alpha_2^2) + \left(kH^0_{s1} + \frac{m}{a} H^0_{\varphi 1}\right)^2 N_m(k)\right] \cdot \frac{\varphi_3(k)}{F}.$$

(7). It is concluded that long-wave inflections (m=1, kb ≤ 1) cannot be stabilized by a longitudinal magnetic field. The criterion (7) for stability against these perturbations can be fulfilled under the condition

$$\frac{\alpha_2^2 a^2}{b^2} \cdot \frac{H^{02}_{\varphi 1}}{H^{02}_{\varphi 2}} > -\frac{K_0(kb)}{K_1(kb)}.$$

Card 6/7

S/057/62/032/010/004/010
B104/B102

Stability of an ....

ASSOCIATION: Institut fiziki AN USSR, Kiyev (Institute of Physics AS UkrSSR, Kiyev)

SUBMITTED: December 30, 1961

Card 7/7

L 31871-66 EWT(m)/ETC(f)/EWP(e)/EWP(t)/ETI IJP(c) AT/WH/ES/WW/JD/JG/GD
ACC NR: AT6013565 (A) SOURCE CODE: UR/0000/65/000/000/0274/0277

64

B+1

AUTHOR: Fedorus, A. G.; Marchuk, P. M.

ORG: Institute of Physics AN UkrSSR (Institut fiziki AN UkrSSR)

TITLE: Thermoelectronic properties of $(UC)_{0.2}$:$(ZrC)_{0.8}$

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Vysokotemperaturnyye neorganicheskiye soyedineniya (High temperature inorganic compounds). Kiev, Naukova dumka, 1965, 274-277

TOPIC TAGS: uranium, zirconium, carbide, thermoelectric convertor, electric power production

ABSTRACT: The thermoelectronic emission of uranium mono- and dicarbides and of solid solution of uranium and zirconium carbodes $(UC)_{0.2}$:$(ZrC)_{0.8}$ was studied in vacuo and the thermoelectronic emission of $(UC)_{0.2}$:$(ZrC)_{0.8}$ solid solution was studied in the presence of cesium vapor. The temperature varied from 1620°K to 2200°K and the cesium vapor pressure varied in a wide range (saturation pressures corresponding to 70-200°C). The experimental tube used in this work is shown. The cathode thermoelectronic emission efficiency was calculated from the formula

$$\eta \approx \frac{P_M}{P + I_{M^+}},$$

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ACC NR: AT6013565

where P_M is the maximum specific output per cathode unit surface area, P is the intensity of thermal radiation per cathode unit surface area, j_M is the cathode current density corresponding to P_M, and Y is the work function corresponding to j_M at a given temperature. Orig. art. has: 4 figures, 1 formula.

SUB CODE: 07, 09/ SUBM DATE: 03Jul65/ ORIG REF: 001/ OTH REF: 003

Card 2/2

L 44182-66 EWT(l)/EWT(m)/T/EWP(t)/ETI IJP(c) JD/WW/JG/AT

ACC NR: AP6022999 SOURCE CODE: UR/0185/66/011/004/0411/0415

101
99
B

AUTHOR: Fedorus, O. G.; Marchuk, P. M.

ORG: Institute of Physics, AN URSR, Kiev (Instytut fizyky AN URSR)

TITLE: Thermionic and absorptive properties of zirconium nitride in cesium vapor

27 27 27

16

SOURCE: Ukrayins' kyy fizychnyy zhurnal, v. 11, no. 4, 1966, 411-415

TOPIC TAGS: thermionic emission, zirconium, radiation effect, volt ampere characteristic, temperature dependence, ion emission, cesium, heat of evaporation

ABSTRACT: Thermionic emission and some other properties of zirconium nitride have been investigated in a cesium vapor atmosphere on cathode samples of metal powder. The coefficients of monochromatic and integral radiation were measured over a wide temperature range ($e_\lambda = 0.53-0.42$ and $e_t = 0.52 - 0.54$). The volt-ampere characteristics of vacuum and cesium diodes were taken. The temperature dependences of thermionic emission and the effective work function of

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L 44182-66

ACC NR: AP6022999 2

zirconium nitride cathodes ($\varphi_A = 3.3 - 3.5$ ev) were determined. The emission of ions obtained on the contact ionization of cesium on a zirconium nitride surface was measured. The results of measurements are in good agreement with the Saha-Langmuir law. The heat of evaporation of cesium atoms and ions from the zirconium nitride surface (with degrees of coating close to zero, $\varphi_a = 2.4$) is estimated. The authors' thank L. H. Nikolayev for his x-ray diffraction analysis of the samples. Orig. art. has: 3 figures. [Based on authors' abstract] [NT]

SUB CODE: 20/ SUBM DATE: 10Jul65/ ORIG REF: 006/

Card 2/2

MARCHUK, P.P.

Milking machine with common vacuum milk pipes. Mekh. sil'. hosp. 11 no.5:11-12 My '60. (MIRA 14:3)

1. Starshiy mekhanik Trostyanetskoy remontno-tekhnicheskoy stantsii, Vinnitskoy oblasti.
(Milking machines)

MARCHUK, V.

New system of selling motorbus tickets. Avt.transp. 40 no.5:18-20 My '62. (MIRA 15:5)

1. Zamestitel' upravlyayushchego Kiyevskim oblastnym avtomobil'nym trestom.
(Motorbus lines--Fares)

L 04064-67 EWT(d)/EWT(m)/EWP(h)/T-2/EWP(e)/EWP(t)/ETI IJP(c) WH/JD

ACC NR: AP6027557 SOURCE CODE: UR/0143/66/000/005/0060/0065

50
49
B

AUTHOR: Marchuk, V. A. (Engineer)

ORG: Odessa Polytechnic Institute (Odesskiy politekhnicheskiy institut)

TITLE: Interaction between the elements of the flow through section of gas turbines with a stream of gas dusted with fine particles of minerals

SOURCE: IVUZ. Energetika, no. 5, 1966, 60-65

TOPIC TAGS: turbine design, gas turbine, erosion

ABSTRACT: The object of the article is the study, on flat samples, of the laws governing the formation of deposits at different angles of attack, velocities, and temperatures of a gas stream dusted with fine particles of quartz, calcite, magnetite and hematite. In the tests, the gas stream was dusted with fine particles of the mineral fractions: 74-53 microns; 53-17 microns; 28-2 microns; 40-25 microns; 25-18 microns; 18-12 microns; and 12-0 microns. The powders were prepared by grinding lumps of the minerals in a ball mill with subsequent screening. The conditions of the tests were as follows: 1) the nozzle was square, contracting, direct, with an exit cross section of 8.9 x 8.9 = 79.21 mm^2 and a total length of 31.3 mm; 2) the working section of the sample was

Card 1/2 UDC: 621.438

L 04064-67

ACC NR: AP6027557

20 x 20 x 3 mm; 3) the material of the sample was Steel 1Kh18N9T; 4) the amount of powder in the main tests was 100 grams; 5) the angle of attack in the main tests was 30%; 6) duration of the test was 10 minutes. The experimental results are exhibited in tables and plotted in a series of curves. In tests at temperatures of the gas in front of the nozzle from 600-1200°C there was erosion of the samples. With a stream of gas dusted with magnetite particles of fractions 25-18 and 18-0 microns, at a gas temperature before the nozzle of 800°C, formation of deposits on the surface of the samples was observed. When the temperature was raised to 1200°C, larger particles of magnetite deposited on the samples. With small fractions of calcite (less than 74 microns) and a temperature of 600-1200°C, deposits also formed on the samples. With a decrease in the particle size, an increase in the amount of particles in the gas, and an increase in the angle of attack, the deposition increased continuously. With an increase in the gas flow velocity, deposition decreased. Orig. art. has: 5 figures and 2 tables.

SUB CODE: 13 / SUBM DATE: 30Mar65/ ORIG REF: 004/ OTH REF: 001

KH

Card 2/2

KLEVTSOV, I.V., inzh.; MARCHUK, V.D., inzh.

Reducing the seismic effect of large scale blasting in pits. Bezop.truda v prom. 6 no.12:19-21 D '62. (MIRA 15:12)

1. Yuzhnyy gornoobogatitel'nyy kombinat (for Klevtsov).
2. Krivorozhskiy nauchno-issledovatel'skiy institut gornorudnoy promyshlennosti (for Marchuk).
(Blasting)

MARCHUK, Ye. A.

Diagnosis of placental defects. Akush. i gin. no.4:47-52 '62.
(MIRA 15:7)

1. Iz akushersko-ginekologicheskoy kliniki (zav. - prof. A. V. Anisimov) Stanislavskogo meditsinskogo instituta.

(HEMORRHAGE, UTERINE) (PLACENTA)

MARCHUK, Ye.A.; KOSHIK, T.F.

Cavernous angioma of the vaginal wall. Akush. i gin. 40 no.2: 127-128 Mr-Ap '64. (MIRA 17:11)

1. Kafedra akusherstva i ginekologii (zav. - prof. A.V. Anisimov) i kafedra patologicheskoy anatomii (zav. - prof. A.V. Sosunov) Stanislavskogo meditsinskogo instituta.

MARCHUK, Yu.N; MOTORIN, Yu.A.; PAVLOV, V.A.

Some problems of syntactical analysis in machine translation.
NTI no.3:44-46 '64. (MIRA 17:7)

L 38091-65 EWT(1)/T/EEC(b)-2 Pi-4 IJP(c) GG

ACCESSION NR: AP5005917 S/0185/65/010/002/0222/0223

AUTHOR: Vyshnevs'kyy, V. N.; Vus, Ya. M.; Kulyk, L. M.; Marchuk, Ye. P.; Romanyuk, M. O.

TITLE: Determination of reflection spectra in the vacuum region of the spectrum

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 2, 1965, 222-223

TOPIC TAGS: reflection spectrum, ultraviolet, vacuum ultraviolet, spectrograph, potassium chloride, potassium bromide, single crystal

ABSTRACT: The article describes apparatus for the determination of the spectra of reflection from solids in the region of vacuum ultraviolet, using a DFS-5 spectrograph. The apparatus makes it possible to obtain the reflection spectrum for an angle of incidence of 45° in the entire 2000—500 Å range of the spectrograph. The apparatus is shown in Fig. 1 of the Enclosure. By way of an example, the authors show the reflection spectra of KCl and KBr single crystals in the 2000—1000 Å range. The results are in good agreement with the data of H. R. Phillip and H. Ehrenreich (Phys. Rev. v. 131, 2016, 1963). Whatever differences are observed are due to the increase in the reflecting ability of these crystals in the short wave

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L 38091-65
ACCESSION NR: AP5005917

region. A similar effect in this region of the spectrum at large angles of incidence is observed also for other substances by R. A. Knapp (Phys. Rev. v. 132, 1891, 1963). "We thank B. O. Belikovich for supplying the crystals." Orig. art. has: 2 figures.

ASSOCIATION: L'vivs'kyy derzhuniversytet im. I. Franka
(L'vov State University)

SUBMITTED: 11Sep64 ENCL: 01 SUB CODE: OP

NR REF SOV: 000 OTHER: 002

Card 2/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001032220020-9"

S/020/61/141/003/021/021
B103/B101

AUTHORS: Sisakyan, N. M., Academician, Bezinger, E. N., and Marchukaytis, A. N.

TITLE: Participation of plastid lipoids in protein synthesis

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 3, 1961, 748 - 750

TEXT: The bond between lipopeptide and protein molecule was studied to prove directly its participation in protein synthesis. Lipopeptides are located in cell structures where protein synthesis takes place. Hence, lipopeptides are assumed to participate in protein synthesis. Chloroplasts were isolated from 200 - 250 g of young bean leaves (Phaseolus) by fractional centrifuging with 3000 g of saccharose phosphate buffer (pH 7.1) at a maximum of 3 - 4°C. They were ground in a homogenizer in 20 milliliters of the buffer, and incubated in the presence of Mg^{2+} ions at room temperature and a pH of 7.0. 0.25 milliliters of glycine-1-C^{14} solution (corresponds to 328,000 imp/min) and 1 milliliter of chloroplast suspension were added to each sample. The inclusion was periodically interrupted by addition of 0.01 milliliters of 10% HCl (pH~1) and rapid cooling. Before adding a suspen-

sion, HCl was mixed with the control samples. After incubation, the test tubes were centrifuged the deposit was washed with water and extracted three times with a 75% alcohol (up to a pH of 4, acidified with HCl). Thus, the lipoproteid fraction was obtained from plastids. The following fractions were obtained: "lipoid I", "protein I", and "protein II" whose radioactivity was determined. Under the above-mentioned conditions, glycine-1-C^{14} was found to be included almost simultaneously in the lipoid and protein parts of lipoproteid. At a pH of 5.8, the inclusion of radioactive label in the lipoid part is independent of Mg^{2+}, whereas this inclusion is completely missing in the protein part without Mg^{2+}. Thus, it was shown that amino acids in isolated plant plastids were included in proteins with active participation of lipoids bound to proteins. Besides nucleic acids, lipoid substances are also assumed to take part in the activation and transport of amino acids. Their participation however, can be of a different nature; thus, especially lipoids may take part in the regulation of permeability processes. The studies are being continued. There are 1 figure, 2 tables, and 20 references: 9 Soviet and 11 non-Soviet. The three most recent references to English-language publications read as follows: C. B. Hunter, R. A. Goodsall, Biochem. J., 78, 561 (1961); T. Fukui, B. Axelrod,

S/020/61/141/003/021/021
B103/B101

Participation of plastid...

Federat. Proc., 19, 6 (1960); T. Fukui, B. Axelrod, J. Biol. Chem., 236, 811 (1961).

SUBMITTED: August 23, 1961

Card 3/3

L 22459-65 EWT(d)/BXT/EED-2/EWP(1) Po-4/Pq-4/Pg-4/Pk-4 IJP(c) BB/GG

ACCESSION NR: AP5000889 S/0315/64/000/009/0035/0038

AUTHOR: Marchuk, Yu. N.

TITLE: Automation of the construction of a translation scheme for multiple-meaning words during machine translation

SOURCE: Nauchno-tekhnicheskaya informatsiya, no. 9, 1964, 35-38

TOPIC TAGS: machine translation, multiple meaning word, context analysis, dictionary, word meaning, lexical determinate, morphological determinate

ABSTRACT: Certain questions which arise from a close consideration of the question of multiple meaning are discussed. The following axiom is stated: For every multiple-meaning word there exists a defining context with limits (a,b) such that it contains at least one determinant which uniquely determines one of the meanings of the word. A schematic analysis of a translation of the English work "lock" is presented. It is concluded that: 1. work with multiple-meaning words may be facilitated significantly if schemes determining the selection of the required meaning of a given multiple-meaning word are made standard; 2. standardization of the scheme for translating multiple-meaning words makes it possible to automate the process of forming dictionary patterns. The proposed variation of the automation of scheme construction may be easily accomp-

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L 22459-65

ACCESSION NR: AP5000889

lished by machine using a program in standard operations for machine translation algorithms. "The work is based on results obtained in the laboratory of Yu. A. Motorin." Orig. art. has: 2 tables and 2 figures.

ASSOCIATION: none

SUBMITTED: 22Jun64 ENCL: 00 SUB CODE: DP

NO REF SOV: 006 OTHER: 000

Card 2/2

AUTHOR: Marchuk, Yu. N.; Motorin, Yu. A.; Pavlov, V.A. 42

B

TITLE: Some questions of syntactic analysis in machine translation

SOURCE: Nauchno-tekhnicheskaya informatsiya, no. 3, 1964, 44-46

TOPIC TAGS: machine translation, syntactic analysis, automatic translation, normative grammar, connecting work, punctuation

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ABSTRACT: This article is a discussion of the methods of binary machine translation of English into Russian, and the syntactic analysis of grammar required for automatic translation. Among the sujects discussed are the problems of the simplification of complicated sentences and the principles of arranging the sentence in such a way as to make syntactic analysis possible. The author classifies the schemes for grammatical analysis into three categories: (1) Use of the rules of normative grammar; (2) Formalization of certain rules of normative grammar which are not sufficiently formalized or systematized; (3) An empirical search for new normative rules and the accumulation of pertinent statistics. The author feels that if an algorithm is constructed on the above pattern, the ensuing statistics will be meaningful for a perfect translation. This knowledge makes possible the establishment of rules for the distribution of signs given in the output of

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L 27858-65

ACCESSION NR: AP5000878

the scheme which are necessary for the statistical evaluation of its effect. A discussion of the problem of establishing a correct meaning for the conjuctions "and", "but" and "or" follows, including a discussion of the correct placement of commas in the translation.

ASSOCIATION: none

SUBMITTED: 01Jul63 ENCL: 00 SUB CODE: DP

NO REF SOV: 003 OTHER: 001

Card 2/2

M[illegible].

[illegible] the role of substantive and verb in an English text [illegible] grammatical analysis for machine translation. NTI no.3:39-[illegible]. (MIRA 18:6)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001032220020-9"

SISAKYAN, N. M., akademik; BEZINGER, E. N.; MARCHUKAYTIS, A. S.
[Marcukaitis, A.]

Role of chloroplast lipoproteids in protein synthesis.
Dokl. AN SSSR 147 no.6:1493-1494 D '62. (MIRA 16:1)

1. Institut biokhimii im. A. N. Bakha AN SSSR.

(Chromatophores) (Lipoproteins)
(Protein metabolism)

MARCHUKOV, B.

"Thinking" regulator. IUn.tekh. 4 no.7:35-37 Jl '60.
(MIRA 13:9)

(Automatic control) (Pressure regulators)

MARCHUKOV, M.

CHEESE

Marking cheese according to grade. Mol. prom. 13 No. 9, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

AID P - 5572

Subject : USSR/Aeronautics - maintenance

Card 1/1 Pub. 135 - 11/27

Author : Marchukov, N. P., Eng.-Lt.Col.

Title : The exploitation of aerial targets

Periodical : Vest. vozd. flota, 6, 64-68, Je 1956

Abstract : This article deals with the maintenance, towing and repair of aerial targets. Four sketches.

Institution : None

Submitted : No date

GOLOVANOV, I.; MARCHUKOV, V.

We are reducing our fire-fighting force. Muk.-elev. prom. 26 no.9: 24 S '60. (MIRA 13:9)

1. Sektretar' partorganizatsii Archedinskogo krupokombinata Stalingradskoy oblasti (for Golovanov). 2. Glavnyy mekhanik Archedinskogo krupokombinata Stalingradskoy oblasti (for Marchukov).
(Stalingrad Province--Fire prevention)

MARCHUKOV, V.I. (Engr.)

"Line of Stands for Mechanized Treating of Surface Models."

report presented at the 13th Scientific Technical Conference on the Kuybyshev Aviation Institute, March 1959.

KHUDOMINSKAYA, L.S.; DAUENGAUER, G.A.; MARCHENKOVA, A.A.

Spectrophotometric determination of the aromatic hydrocarbons in the pyrolysis products of chamber natural gasoline. Trudy VNIIT no.13:232-237 '64. (MIRA 18:2)

KHUDOMINSKAYA, L.S.; AKSENOVA, N.N.; RADOMYSL'SKAYA, T.N.; MARCHUKOVA, P.A.

Quantitative determination of sodium and potassium in the ash of shales and peat using flame photometry. Trudy VNIIT no.12:205-212 '63. (MIRA 18:11)

Marchukova, I.D

TRONOVA, N. V., MARCHUKOVA, I. D., and BOROVSKIY, I. B.

"Investigation of X-ray L-Spectra of Some Rare-earth Element Compounds"

Materials of the 2nd All-Union Conference on X-ray Spectroscopy; Moscow, January 31 February 4, 1957 (Materialy II Vsesoyuznogo soveshchaniya po rentgenovskoy spektroskopii; Moskva, 31 yanvarya -4fevralya 1957 g.)

Izvestiya Akademii nauk SSSR, Seriya fizicheskaya 1957, LVol 21, Nr 10, pp 1341-1342 (USSR)

FIZFAK MGU

AUTHOR: Borovskiy, I.B., Il'in, N.P., Loseva, L.Ye., Marchukova, I.D., Deyev, A.N. 48-10-13/20

TITLE: X-Ray Spectral Investigations of the Chemical Composition in Microvolumes of Alloys (Rentgenospektral'nyye issledovaniya khimicheskogo sostava v mikroob"yemakh splavov)

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1957, Vol.21, Nr 10, pp.1415-1423 (USSR)

ABSTRACT: The method described here was at the same time developed by Kasten in France (since 1951) and also in the USSR. The characteristic feature of the method is the following: The metallographical microsection surface to be investigated is inserted into the special X-ray tube instead of the anode. The anode "mirror" is the ground surface the microstructure of which can be observed in the metal microscope which is mounted in the tube. By means of microscrews the sample can be displaced in the anode plane. At the Institute for Metallurgy the RSASh-2 unit, an X-ray spectrograph for the analysis of microsection surface elements of from Fe^{26} to Mo^{42} and from Hf^{72} to U^{92} was worked out. Besides, the model for the RSASh-ZD unit is already completed, by means of which it is possible to investigate the elements from Fe^{26} up to and including Mg^{12}. The results

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X-Ray Spectral Investigations of the Chemical Composition in Microvolumes of Alloys

obtained by several investigations carried out by means of this device are discussed here. It is shown that the following problems can be solved quickly and reliably by means of this method: Analysis of the phase composition of complexly alloyed alloys, investigation of the degree of de-liquation in alloys, investigation of the order of distribution of alloy additions and their re-distribution during aging, deformation, heat treatment, investigation of diffusion- and other intermediate layers, of granular boundaries, and of the processes taking place in them. There are 6 figures and 2 tables.

ASSOCIATION: Laboratory for Methods of Physical Research at the Institute for Metallurgy imeni A.A.Baykov AS USSR (Laboratoriya fizicheskikh metodov issledovaniya instituta metallurgi im.A.A.Baykova AN SSSR)

AVAILABLE: Library of Congress

SOV/126-6-1-19/33

AUTHORS: Troneva, N. V., Marchukova, I. D. and Borovskiy, I. B.

TITLE: The L-series X-ray Lines of Ce in CeB_6 and CeO_2 (Rentgenovskiye L-spektry tseriya v CeB_6 and CeO_2)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 1, pp 141-147 (USSR)

ABSTRACT: The spectra are studied in emission and absorption, using a photographic vacuum spectrograph (not described) at a dispersion of 14.5 kX/mm. The preparation and structure of the materials is discussed in some detail the electron band structure in these crystals being the ultimate point of interest in the work. Figs. 1-3 show microphotometer traces for some of the lines, or drawings deriving therefrom. (1 and 2 in emission, 3 in absorption, using the continuum from a W anode). Table 1 is concerned with the electron band structures in the compounds, Tables 2-4 with the experimental results. It is concluded that the bonding and valence state have a substantial influence on the L-levels, particularly the upper ones. Ionic bonding broadens the line absorptions (5d and 6s states) and causes a shift in level, relative to metallic bonding. The shift related to the 4f state

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in CeB_6 indicates an apparent valency of less than 4, in agreement with the data of Ref.(19). It is also concluded that the 5d and 6s states play a considerable part in the bonding, unlike the 4f, as earlier magnetic data indicate.
There are 3 figures, 4 tables and 26 references, 10 of which are Soviet, 7 English, 8 French, 1 German.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: November 12, 1956

Card 2/2

1. Cerium boride crystals--X-ray analysis 2. Cerium boride crystals--Spectra 3. Cerium oxide crystals--X-ray analysis 4. Cerium oxide crystals--Spectra

3(1),18(3)

AUTHORS: Yavnel', A. A., Borovskiy, I. B., Il'in, N. P., Marchukova, I. D.

SOV/20-123-2-12/50

TITLE: The Investigation of the Composition of the Phases of Meteoritic Iron by the Method of the Local X-Ray Spectrum Analysis (Izucheniye sostava faz meteoritnogo zheleza metodom lokal'nogo rentgenospektral'nogo analiza)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 2, pp 256-258 (USSR)

ABSTRACT: A short report is first given on earlier papers dealing with this subject and on the shortcomings of hitherto employed methods. The authors investigated the phase composition by the method of the X-ray spectrum analysis of the microvolumina. This method was developed a short time ago by I. B. Borovskiy. The object of investigation was the iron meteorite Chebankol found in 1938, which, according to analyses carried out by M. I. Dyakonova, contains 9.03 % Ni and 0.44 % Co. The continuous distribution of iron, nickel, and cobalt with recording of the concentration curves during passage through the "bars" of the α-phase and through the strips of the γ-phase was investigated. The authors determined the composition of the

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phases by which a Widmannstätten (Vidmanshtet) structure is formed. In the case of a fine-grained phase mixture the average composition was determined. A diagram shows the typical result obtained by the first measuring series. A conspicuous feature is the distinctly marked boundary between the phases in form of a "jump" of the content of all important components of the alloy. All measurements distinctly showed an increase of the nickel content and a decrease of the iron and cobalt content extending from the center of the strip of the γ-phase in the direction towards its edge, in which case the extremum value is on the boundary itself. According to the above-mentioned data the crystal was no longer heated after crystallization to such an extent as might cause a change of the composition and ratio of the phases on the boundary by which they are divided (even if the entire system did not regain full equilibrium). Both phases of the meteoritic iron are of inhomogeneous composition in spite of exceedingly slow cooling down, i.e. the system is not fully in equilibrium. The temperatures corresponding to the results obtained differ among one another by about 20 °. Causes that might possibly be

responsible for this non-agreement are mentioned. The data obtained for the variation of nickel concentration might indicate a decrease of the solubility limit of nickel in the α-phase with an increase of the degree of cooling, beginning from a certain temperature value. Also the measurements carried out of the phase composition of such parts of the plessite in which the strips of the γ-phase are subdivided by narrow strips of the α-phase showed a similar distribution of elements. There are 3 figures, 1 table, and 8 references, 1 of which is Soviet.

ASSOCIATION: Komitet po meteoritam Akademii nauk SSSR (Committee for Meteorites of the Academy of Sciences, USSR)
Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Institute for Metallurgy imeni A. A. Baykov of the Academy of Sciences, USSR)

BOROVSKIY, I.B.; DEYEV, A.N.; MARCHUKOVA, I.D.

Using the X-ray spectrum method for local analysis of platinum minerals. Geol.rud.mestorozh. no.6:68-73 N-D '59. (MIRA 13:7)

1. Institut metallurgii AN SSSR, Moskva.
(Platinum minerals--Spectra)

5(4)

AUTHORS: Borovskiy, I. B., Marchukova, I. D. SOV/20-125-4-41/74

TITLE: A Method of Determining the Phase State of Binary Systems (Metod opredeleniya fazovogo sostoyaniya dvoynykh sistem)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 4, pp 835-837 (USSR)

ABSTRACT: Reference is first made to several earlier papers dealing with this subject. The method mentioned in the title is characterized by the fact that in a special X-ray tube ground section of the alloy to be investigated is substituted for the anode. The electron beam accelerated up to from 30,000 to 40,000 v is focused to a narrow probe by a system of electromagnetic lenses, the diameter of which on the surface of the ground section amounts to 0.1 to 2μ. On this surface the electrons of the probe excite the characteristic X-ray radiation of the atoms of the substance. This radiation is then decomposed into a spectrum by means of a curved crystal and is fixed by means of a quantum counter. Determination of the wave lengths of the characteristic X-ray radiation makes it possible to determine the qualitative composition of the alloy. By comparing the line intensities of the element in the samples and in "standard"

it is possible to determine the quantitative fraction of a given element in the sample under investigation. In the course of investigations of diffusion layers in various binary systems (Cu-Zn, Cu-Au, Mo-Be, Mo-Si, Al-Si, etc.) by means of this method it was found that, in the case of a suitable selection of the samples, all phases are formed in the diffusion layer that exist according to the state diagram of the given system. Besides, it was found that no regions of phase mixture exist in the diffusion layer. The limits of concentration of the phases do not correspond to the concentration limits of the phase diagram. This is connected with the specific conditions of phase stability in the diffusion layer. Therefore, the data determined in the course of investigations of diffusion layers can be used only for the construction of a skeleton-scheme of the phase diagram, and they do not give the exact boundaries between the individual phases. The authors suggest the following method of constructing the phase diagram: For a binary system a diffusion layer is produced by means of a contact method, from which, also by the contact method, the number of phases in the system at annealing temperature and their "con-

centration expansion" is determined. Next, samples are produced which have a composition that corresponds to the regions of the phase mixture with respect to concentration. These samples are then annealed at different temperatures, and determination of their phase composition renders it possible to determine the temperature dependence of the concentration limits of the determined phases. The domains corresponding to the phase mixture are determined directly from the concentration curves of the diffusion layers. This method was checked in connection with the classical mixtures copper-zinc and copper-gold. In this respect the Cu-Au system is especially interesting. The system may be used also if in the system there are "phases of an ordered state". There are 4 figures, 1 table, and 7 references, 5 of which are Soviet.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Institute of Metallurgy imeni A. A. Baykov of the Academy of Sciences, USSR)

BOROVSKIY, I.B., MARCHUKOVA, I.D.

Method of constructing phase fields of constitutional diagrams.
Trudy Inst. met. no.6:73-76 '60. (MIRA 13:8)
(Phase rule and equilibrium) (Alloys--Metallography)

YAVNEL', A.A.; BOROVSKIY, I.B.; IL'IN, N.P.; MARCHUKOVA, I.D.

Using the method of local X-ray spectral analysis for determining the composition of phases in meteorite iron.
Meteoritika no.18:77 '60. (MIRA 13:5)
(Meteorites) (X-ray spectroscopy)

POPLAVKO, Ye.M.; MARCHUKOVA, I.D.; ZAK, S.Sh.

A rhenium-containing mineral from the ores of the Dzhezkazgan deposit. Dokl. AN SSSR 146 no.2:433-436 S '62. (MIRA 15:9)

1. Nauchno-issledovatel'skiy i proyektnyy institut redkometallicheskoy promyshlennosti i Institit metallurgii im. A.A. Baykova.
(Dzhezkazgan—Rhenium) (Minerals)

MARCHUKOVA, I.D.; POPLAVKO, Ye.M.

Rhenium mineral in copper-lead impregnation ores. Trudy Inst. met. no.15:41-42 '63. (MIRA 16:9)
(Nonferrous metals--Analysis) (Rhenium--Analysis)

ACC NR: AP7002735 (A) SOURCE CODE: UR/0126/66/022/006/0849/0858

AUTHOR: Borovskiy, I. B.; Marchukova, I. D.; Ugaste, Yu. E.

ORG: Institute of Metallurgy im. A. A. Baykov (Institut metallurgii)

TITLE: Investigation of interdiffusion in binary systems forming continuous series of solid solutions, by the method of local x-ray spectral analysis. 1. Fe-Pd, Co-Pd, Ni-Pd, Cu-Pd systems

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 6, 1966, 849-858

TOPIC TAGS: x ray spectral analyzer, metal diffusion, binary alloy, palladium base alloy, iron, cobalt, nickel, copper / RSASh-2 local x-ray spectral analyzer

ABSTRACT: This is the first of a series of reports on the investigation of diffusion in the "most elementary" (binary) systems forming continuous series of solid solutions, prompted by the current state of the phenomenological and microscopic theories of diffusion. The features of interdiffusion in binary systems are characterized by the concentration dependence of the interdiffusion coefficient $D_{i.d.}$ The interdiffusion process may be described with the aid of Fick's 2nd phenomenological equation

 UDC: 669.017:548.526

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001032220020-9"

$$\frac{\partial c}{\partial t} = \frac{\partial}{\partial x}\left(D_{\text{i.d.}}\frac{\partial c}{\partial x}\right), \qquad (1)$$

where c is the concentration of a given $D_{\text{i.d.}}$ element at point x at time instant t. Thus the problem of determining the function $D_{\text{i.d.}}(c)$ reduces to determining the concentration dependence of elements in the diffusion zone and the accuracy of calculation of $D_{\text{i.d.}}$ depends on the accuracy of plotting the curve of $c = c(x)$. It is shown that the method of local x-ray spectral analysis of chemical composition can be used to investigate interdiffusion in the systems Fe-Pd, Co-Pd, Ni-Pd, Cu-Pd over a broad range of temperatures provided that the investigator works only with the radiation of the element for which fluorescent excitation is absent in given binary system. Thus, the distribution of the concentration of investigated elements (such as Fe, Co, Ni) in the diffusion zone of vacuum-welded diffusion pairs can be analyzed according to the radiation of the lines Fe K_α, Co K_α, and Ni K_α, respectively, with the characteristic x-ray spectrum being excited only be electron impact, in a RSASh-2 local x-ray spectrum analyzer. The resulting averaged and corrected curves of concentration are used to calculate the values of $D_{\text{i.d.}}(c)$ over the entire range of concentrations. No unambiguous correlation could be,

ACC NR: AP7002735

established between these values and the fusibility diagrams of each system. The elucidation of the concentration dependence of the "effective" mobility of atoms on the basis of various physical characteristics of the alloys in binary alloys will be the subject of subsequent investigations. Orig. art. has: 2 tables, 4 figures, 3 formulas.

SUB CODE: 11, 20/ SUBM DATE: 04Apr66/ ORIG REF: 005/ OTH REF: 019

Card 3/3

USSR/Zooparasitology - Ticks and Insects Vectors of Disease Agents. G

Abs Jour : Ref Zhur Biol., No 1, 1959, 1054

Author : Marchenkova, Ye.A.

Inst : Voronezh University

Title : Anophelogenic Importance of Bottom Land Reservoirs on the Outskirts of the Forest-Steppe and Steppe Zone (in Eastern Voronezhskaya Oblast')

Orig Pub : Byul. O-va yestestvoispyt. pri Voronezhsk, un-te, 1956, 10, 75-82

Abstract : Anophelogenic reservoirs in the Borisoglebskiy Rayon are principally located on bottom lands of the Voronа and Khopr rivers (lakes, rivers and their creeks, stagnant waters and pools remaining on the bottom land after recession of the water). The stagnant water is of the

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USSR/Zooparasitology - Ticks and Insects Vectors of Disease Agents. G

Abs Jour : Ref Zhur Biol., No 1, 1959, 1054

greatest anophelogenic significance (AS), and in the 2d half of the summer -- the lakes. Favorable conditions for the rapid development of Anopheles larvae exist in the spring and beginning of the summer in the presence of numerous pits in the ground. The AS of reservoirs of open and afforested bottom land in different parts of the season is reproted. -- N.Ya. Markovich.

Card 2/2

MARCHUKOVA, Ye.A.

Seasonal population and epidemiological role of Anopheles maculipennis in the forest-steppe of the southeastern Black Earth Region. Med.paraz. i paraz.bol. 27 no.1:97 Ja-F '58. (MIRA 11:4)

1. Iz kafedry obshchey biologii Voronezhskogo gosudarstvennogo meditsinskogo instituta.
(CENTRAL BLACK EARTH REGION--MOSQUITOES)

MARCHUKOVA, Ye.A.

Midges in the bottom-land biotopes of Voronezh Province [with summary in English]. Zool. zhur. 37 no.8:1254-1255 Ag '58.
(MIRA 11:9)

1.Kafedra biologii Voronezhskogo meditsinskogo instituta.
(Voronezh Province--Diptera)

MARCHUKOVA, E. A. and RYABYKH, L. V.

"On the Fauna and Biology of Blood-Sucking Diptera, the Carriers of Human and Animal Infections in the Southeast of the Black Soil Center."

Tenth Conference on Parasitological Problems and Diseases with Natural Reservoirs, 22-29 October 1959, Vol. II, Publishing House of Academy of Sciences, USSR, Moscow-Leningrad, 1959.

Voronezh Medical Institute

MARCHUT, Maria; ROSZKOWSKI, Andrzej

General views on methods for the determination of urinary 17-keto-steroids. Pol. tyg. lek. 17 no.7:265-270 12 F '62.

1. Z Zakladu Chemii Organicznej AM w Krakowie; kierownik: prof. dr Wladyslaw Kahl.

17-KETOSTEROIDS urine)

PIGON, Halina; MARCHUT, Maria

Determination of urinary estrogens using Brown's method with the application of domestic reagents. Endokr. Pol. 14 no.6:527-536 N-D '63.

1. Katedra Fizjologii Zwierzat Wyzszej Szkoly Rolniczej w Krakowie (Kierownik: Prof. dr Z. Ewy) i Katedra Chemii Organicznej Akademii Medycznej w Krakowie (Kierownik: Prof. dr W. Kahl).

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18 1150

P/039/60/000/010/003/004
A224/A026

AUTHORS: Serwicki, Henryk,; Marchwica, Józef, Masters of Engineering

TITLE: Acid-Resistant Chromium-Nickel-Manganese Steels with Addition of Nitrogen

PERIODICAL: Hutnik, 1960, No. 10, pp. 379 - 384

TEXT: The paper deals with the chemical composition and acid-resisting properties of austenitic chromium-nickel-manganese steels with and without the addition of nitrogen. The purpose was to determine the possibility of producing these steels in Poland as a substitute for high-nickel-content steels. Research has been conducted in the Huta "Baildon" ("Baildon" Metallurgical Plant) since 1953, with the stress on the development of acid-resisting steels having a low nickel content, and nitrogen as the austenite producing component. Two types of steel have been developed with the following composition:

	C %	Mn %	Si %	P %	S %	Cr %	Ni %	N_2 %
Type I	max. 0.07	7 - 9	max. 0.8	max. 0.04	max. 0.03	16 - 18	3.5 - 4.5	0.12 - 0.25

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P/039/60/000/010/003/004
A224/A026

Acid-Resistant Chromium-Nickel-Manganese Steels with Addition of Nitrogen

	C %	Mn %	Si %	P %	S %	Cr %	Ni %	N_2 %
Type II	max. 0.10	7 - 9	max. 0.8	max. 0.04	max. 0.03	16 - 18	3.5 - 4.5	0.12 - 0.25

Type I steel is resistant against intercrystalline corrosion; Type II steel is not. Corrosion tests in HNO_3 and its water solutions revealed that both steel types are not resistant in boiling concentrated HNO_3; they do posses a sufficient resistance in the concentrated HNO_3 at 50°C. Trial applications of these steels have been made in the Zakłady Azotowe im. P. Findera (Nitrogen Works imeni P. Finder) in Chorzów. In conclusion, the authors state that this type steel with a maximum carbon content of 0.07% is suitable for application in the nitric acid processing equipment. Moreover, the steel can be used as a substitute for 1H18N9T steel in all cases where the latter is not subjected to corrosive attack. There are 7 photographs and 5 references: 2 English, 2 Polish, and 1 German.

ASSOCIATION: Huta "Baildon" - Katowice ("Baildon" Metallurgical Plant in Katowice)

Card 2/2

P/043/62/000/004/001/001
D004/D101

AUTHORS: Serwicki, Henryk, Master of Engineering, and Marchwica, Józef, Master of Engineering

TITLE: Production of substitute steels for austenite chromium-nickel steels type 18/8

PERIODICAL: Wiadomości hutnicze, no. 4, 1962, 108-113

TEXT: Substitute steels to replace costly acid-resistant austenite chromium-nickel steels were subject to a series of tests carried out on cross joint welded steels at Huta Baildon (Metallurgical Plant Baildon). The test steels were Cr-Mn-Ni-N and H17T types. The experiments were mainly concerned with the carbon content in steel and its effect on intrinsic and after-welding brittleness and intercrystalline corrosion. Conclusions: To prevent undesirable effects on the properties of finished steel, reduction of the carbon content to less than 0.06% is recommended. For production of Cr-Mn-Ni-N steels, the suggested materials are ferro-chromium obtained by a method developed at the Instytut Metalurgii

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Production of substitute steels ...

Żelaza, IMŻ (Institute of Iron Metallurgy), which contains only 0.058% C, a furnace charge of Armco or nickel Armco, and metallic manganese with no more than 0.10% C. In the case of H17T steel, further tests are recommended to reduce the carbon content for lower hardness. Two methods of making low carbon H17T steel are suggested: the use of IMŻ-made ferro-chromium in the induction furnace process and oxygen fining in arc furnaces. The second method has the disadvantage of considerable furnace wear. In each case the carbon content is reduced to about 0.05%. Stabilizing titanium is added by the formula Ti = 8 x %C. There are 8 figures.

Card 2/2

MARCHWICA, Jozef, mgr inz.

Current problem of preventing the formation of snowflakes in heavy forgings. Hutnik P 30 no. 11: 372-376 N '63.

1. Huta Baildon

LAZOWSKI, Zygmunt; TOMASZEWSKA, Janina; SLOMSKI-SCHMITT, Janina; NIEDZWIECKA, Izabela; MARCHWICKI, Ireneusz

Attempted control of the reactivity of rheumatoid arthritis children treated with physical methods in a spa. Reumatologia (Warsz.) 1 no.2:143-145 '63.

1. Z Instytutu Reumatologicznego w Warszawie (Dyrektor: dr med. W. Bruhl) i Z Uzdrowiska Cieplice Slaskie (Lekarz Naczelny: dr med. J. Timler).

RUMANIA

BAIES, I., Prof, Dr., BAIES, Angela, Dr, CONTIU, I., Dr, POP, M., Dr, MARCIA, D., Dr, ONET, E., Dr, and RUSU, T., Dr, Faculty of Veterinary Medicine (Facultatea de Medicina Veterinara), Cluj

"Epizootological, Clinical and Therapeutic Prophylactic Studies on Sheep and Pig Listeriosis"

Bucharest, Revista de Zootehnie si Medicina Veterinara, Vol 16, No 3, Mar 66, pp 50-59

Abstract: [Authors' English summary modified] A study of several outbreaks of sheep listeriosis and one of swine listeriosis failed to locate common precipitating factors. Bacteriologic tests of Oestrum ovis larvae collected from 40 sheep in active listeriosis outbreaks and 11 sheep with clinically confirmed cases were all negative. No abortions before or during the outbreaks were observed in sheep, but they did occur in sows. All treatments tried were ineffective for diseased sheep; mass treatment of the healthy animals in a focus with a single large dose of penicillin, moldamin, streptomycin or terramycin, however, immediately stopped the outbreak. Includes one table, 5 figures and 15 references, of which 5 are Rumanian, 8 Russian and 2 French.

MARCIA, E.

Distr: 4E2c(j)/4E3b/4E3d

Preparation of cyclobutadiene. C. D. Nenitzescu, Margareta Avram, Eliza Marcia, Maria Maxim, and Doina Dinu (Chem. research center, Acad. R.P.R., Bucharest, Romania). *Acad. rep. populare Romîne, Studii cercetări chim.* 7, 481-504(1959).—A literature review (and results of exptl. work based on it) was presented in connection with the synthesis of cyclobutadiene or alkyl- and aryl-cyclobutadiene derivs. Hofmann degradation of the diquaternary base of 1,3-diaminocyclobutane, thermal decompn. of cycloöctatetraene adducts, and attempts to prepare cyclobutadiene from brominated derivs. of cyclobutane were performed. Cyclobutadiene was detected in $AgNO_3$ and Hg complexes, as well as (for a short period) in the gaseous state. Transformation of the Hg-cyclobutadiene complex into cycloöctatetraene was accomplished. Alkylated and arylated derivs. of cyclobutadiene were prepd. (32 references) (Summaries in Russian and English).

M. Lapidot

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1-BW(BW)
2-Jog(NB)(way)
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RUM/II./Chemical Technology. Chemical Products and Their Application. Pharmaceuticals. Vitamins. Antibiotics. V-17

Abs Jour: Ref Zhur-Khim., No 2, 1959, 5751.

Author : Facler, S; Marcian, Sanda.
Inst :
Title : Concerning the Method of Battery Extraction at the Preparation of Extract of Frangulae.

Orig Pub: Farmacia (Rumin.), 1957, 5, No 5, 410-421.

Abstract: A review of theories of extraction by counterflow presented in the literature and checked at the preparation of liquid Frangulae extract (E) is given. The practical conditions for the preparation of this E by counterflow are shown and the factors of the correct preparation of the E - degree of grinding, duration of the contact with the solvent, most suitable

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[illegible] /Chemical Technology. Chemical Products and Their Application. Pharmaceuticals. Vitamins. Antibiotics. H-17

Abs Jour: Ref Zhur-Khim., No 2, 1959, 5751.

for the extraction, the most profitable method of restoration of the solvent - are found. - ... [illegible]

Card : 2/2

93

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001032220020-9"

MARCIAN, Zbynek

Needless raise of maintenance costs. Elektrotechnik 17 no.2:55 F '62.

1. Elektroudrzbar, Agrostroj, n.p., Prostejov.

[illegible]CIC, [illegible].

Mediterranean conifers in the [illegible] [illegible]. [illegible] 3 .
[illegible] LIST, Zagreb, Vol. [illegible], no. [illegible], [illegible]./[illegible]. [illegible].

SO: Monthly List of East European Accessions, ([illegible]), LC, Vol. [illegible], no. [illegible], Oct. [illegible],
Uncl.

MARCIC, J

MARCIC, J. Mediterranean shrubs in the Dalmatian Karst. p. 11?

Vol. 79, No. 3/4, Mar./Apr. 1955
SUMARSKI LIST
AGRICULTURE
Zagreb

So: MONTHLY LIST OF EAST EUROPEAN ACCESSIONS, (EEAI), LC, Vol. 4, No. 9, Sept. 1955, Uncl.

MARCIC, J.

Glades in southern Dalmatia. p.348. SUMARSKI LIST. Zagreb. Vol 79, no. 9/10, Sept./ Oct. 1955.

SOURCE: East European Accessions List (EEAL), Library of Congress Vol. 5, No. 6, June 1956

MARCIC, J.

Carob trees in karst regions of southern Dalmatia. p. 40

SUMARSKI LIST, Zagreb, Vol 80, No. 1/2, Jan/Feb., 1956

SO: East European Accessions List, Vol 5, No. 10, Oct., 1956

STEJSKAL, Lubor; MARCIK, Miroslav

Rehabilitation prospects of patients after spinal cord injuries. Experiences from the rehabilitation center in Kladruby. Cesk. neur. 24 no.4:251-252 Jl '61.

1. Statni ustav rehabilitacni v Kladruhech, lekarsky reditel MUDr. M. Balzar.

(PARAPLEGIA rehabil)

STEJSKAL, Lubor; MARCIK, Miroslav

Post-traumatic quadroparesis (quadroplegia) and injury of the cervical spine. Cesk. neur. 24 no.4:253-260 Jl '61.

1. Statni ustav rehabilitacni v Kladrubech, lekarsky reditel MUDr. M. Balzar.

(PARAPLEGIA rehabil) (SPINE wds & inj)

STEJSKAL, L.; MARCIK, M.

Clinical picture of spinal cord lesions due to injuries of the 12th thoracic and 1st lumbar vertebrae. Cesk. neurol. 25 no.4:266-273 Jl '62.

1. Statni ustav rehabilitacni v Kladrubech, reditel MUDr. M. Balzar.

(SPINAL CORD dis) (SPINE wds & inj)

CZECHOSLOVAKIA

L STEJSKAL and M. MAREK, Department of Neurology of the State Rehabilitation Institute (Neurologické oddelení Statního ustavu rehabilitacního), Chief (vedoucí) L. STEJSKAL, MD; Kladruby.

"Traumatic Paraplegia with Injuries of Thoracic Spine. Relationship Between Muscular Tone Dynamics and Rehabilitation Prognosis."

Prague, Ceskoslovenska Neurologie, Vol 26 No 2, 1963; pp 126-134.

Abstract [English summary modified]: Review of 57 cases: 22 flaccid (average lesion level T7.12) and 9 spastic (9.33) paraplegia; 23 spastic (8.55) and 3 flaccid (10.66) paraparesis. Paradoxically, flaccid syndromes following complete cord severance may have a better prognosis and greater possibilities of treatment than spastic partial-severance cases. Five tables, diagram; 9 Czech and 15 Western references.

1/1

LAZAROV, Aleksandar; MARCIKIC, Violeta; STOJANOV, Z., ANTONOVSKI, Ljubomir

The frequency of pelvic presentation according to clinical material. God. Zborn. Med. Fak. Skopje no.10:194-203 '63.

1. Ginekolosko-akuserska klinika medicinskog fakulteta u Skopju (Upravnik: Prof. Dr. Anton Cakmakov).

MARCILONEK STANISLAW

10.3-304 551.579.5(438)

Bac, Stanislaw and Marcilonek, Stanislaw. La condensation de la vapeur d'eau dans le sable et dans le gravier en fnc des conditions climatiques en Pologne. [Condensation of water vapor in sand and in gravel in climatic conditions of Poland.] *Acta Geophysica P ica*, Warsaw, 3(4):176-194, 1955. 7 figs., 6 tables, 7 refs. Polish summary p. 193-194. WB, DLC—A very detailed report on the methods, procedures, and results of a study of the water balance in sands of different coarseness and gravel carried out with a series of lysimeters at the State Agronomic Research Station at Pulawy. Long period (1926-1939 and 1941-43) observations have shown that in conditions of the Polish climate, and especially in the summer period, a replenishment of the water reserves takes place in sandy soils by infiltration of rain and snow water. *Subject Headings:* 1. Water balance in sand 2. Lysimeters 3. Poland. —*A.M.P.*

August 3, 1959

GW